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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,640	12/20/2004	Masayuki Furuya	018765-196	2846

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EXAMINER	
KRISHNAN, GANAPATHY	

ART UNIT	PAPER NUMBER
1623	

NOTIFICATION DATE	DELIVERY MODE
10/11/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/518,640	Applicant(s) FURUYA ET AL.	
	Examiner Ganapathy Krishnan	Art Unit 1623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 10-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 10-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>12/04; 08/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The Preliminary Amendment of 12/20/2004 presents Claims 1-4 and 10-27 for examination.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-4 and 10-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites that the hydroxyl groups of the phenol are glycosidically linked to the anomeric carbon of at least two sugar molecules. It is not clear what applicants intent by the recitation, "at least two sugar molecules". For the purpose of prosecution the claim is examined as being drawn to two individual sugar molecules or a sugar molecules wherein two or more monomers are linked to each other.

In formula (1), recited in claim 2, R¹ can be hydrogen or C1-C18 straight or branched alkyl or alkenyl, C1-C18 acyl or optionally substituted benzyl. The claim is drawn to a compound having at least two phenolic hydroxyl groups. This is possible only if at least two of the R¹ groups in structure (1) are hydrogens, as required by the claim recitation, at line 2. According to the recitations for the definitions of R¹, it can all be C1-C18 alkyl or acyl or substituted benzyl or in other words they could be substituted hydroxyls. The claim recitation at line 2, namely, "having at least two phenolic hydroxyl groups " is seen to read on unsubstituted hydroxyls. If R¹ can also be alkyl, acyl or substituted benzyl, then the instant compound will not

Art Unit: 1623

be one that has at least two unsubstituted phenolic hydroxyls. Clarification is needed. The claim is examined as being drawn to a compound that can have both unsubstituted and substituted hydroxyl groups. Claim 2 also recites limitations within parentheses. If these limitations are part of the claim, the parentheses should be deleted.

Claim 11 recites, "hydroxyl groups that may be acetylated or having an acetyl protective group". A clear distinction between a hydroxyl group that is acetylated and one that has an acetyl protecting group is not seen. Both are one and the same. Applicants are required to reword the claim to clearly convey what is intended.

Claims that depend from a rejected base claim that is unclear/indefinite are also rendered unclear/indefinite and are rejected for the same reasons.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Toshiyuki et al (JP 62-263194, English translation; document listed in IDS of Aug. 23, 2005).

Toshiyuki et al teach a process of making a glycoside wherein pentaacetyl glucose (a sugar molecule having an acetyl group attached to the anomeric carbon) is reacted with hydroquinone (a dihydroxy phenol) in the presence of p-toluenesulfonic acid as catalyst to give the corresponding glycoside (page 1, see below the sub heading-Prior art; page 3, paragraphs 8-10; comparative example 2, at page 5). This teaching is seen to meet the limitation of instant

Art Unit: 1623

claim 1 and instant claim 2 for $R^1 = R^2 = H$, n is 2 and m is 3 and instant claim 4. Even though the term hydroquinone suggests that it is a ketone, the compound exists as a tautomer between a p-diketone and p-dihydroxy benzene, which is a phenolic compound with two hydroxyl groups. It reacts with pentaacetyl glucose via the dihydroxy tautomer to give the corresponding glycoside.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

Art Unit: 1623

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

This rejection is for method claims using compounds not covered by the anticipation rejection above.

Claims 2-4 and 10-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toshiyuki et al (JP 62-263194, English translation; document listed in IDS of Aug. 23, 2005) in view of Yujiro et al (JP 2000-319116, English translation; listed in IDS of Aug. 23, 2005).

Toshiyuki et al teach a process of making a glycoside wherein pentaacetyl glucose (a sugar molecule having an acetyl group attached to the anomeric carbon) is reacted with hydroquinone (a dihydroxy phenol) in the presence of p-toluenesulfonic acid as catalyst in xylene, to give the corresponding glycoside (page 1, see below the sub heading-Prior art; page 3, paragraphs 8-10; comparative example 2, at page 5). Even though the term hydroquinone suggests that it is a ketone, the compound exists as a tautomer between a p-diketone and p-dihydroxy benzene, which is a phenolic compound with two hydroxyl groups. It reacts with pentaacetyl glucose via the dihydroxy tautomer to give the corresponding glycoside. The removal of acetic acid under vacuum (lower temperature) is suggested (page 3, paragraph 9). However, Toshiyuki et al do not teach the use of Lewis acid catalyst like boron trifluoride (even though tin tetrachloride is suggested) in their process.

Yujiro et al, drawn to gallic acid derivatives, teach the preparation of a glucoside derivative via the reaction of gallic acid (trihydroxy benzoic acid; compound that meets the structure (1) in claim 2) or its ester (structure (2) in claim 11) with saccharide, including pentaacetyl glucose, that is completely acetylated, in the presence of Lewis acid catalyst, one of

Art Unit: 1623

which is boron trifluoride etherate to give the corresponding glycoside (page 3, paragraph 0011; page 4, paragraph 0018). However, Yujiro et al do not exemplify their process using xylene as the solvent.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the process as instantly claimed and taught by the prior art for making the glycoside as instantly claimed since the process for making such a glycoside using closely analogous starting materials, solvents and catalyst is taught in the prior art.

One of skill in the art would be motivated to use the method as instantly claimed, especially using boron trifluoride and xylene as solvent since the use of benzene as a solvent has a problem with temperature and pressure requirements for the removal of the acetic acid that is generated in the process and control of the reaction is difficult and yield is low (Toshiyuki: page 1, last paragraph though page 2, paragraph 2). Hence one of skill in the art would look for other closely related solvents and Lewis acid catalyst like boron trifluoride in order to have better control of the reaction, easy removal of acetic acid and also improve the yield. It is well within the skill of the artisan to adjust process conditions for the purpose of optimization and to use other derivatives of the phenolic compound as instantly claimed in claims 2-3, in order to extend the scope of the instant method.

Even though, Toshiyuki discloses (page 2, paragraph 3; page 5, comparative examples 2-3) that Wolfrom suggests xylene as solvent the yield is about 50%, one of skill in the art would be motivated to substitute other Lewis acid catalyst like boron trifluoride as suggested by Yujiro still using xylene as solvent in order to improve the yield since xylene has been successfully used as the reaction solvent. One of ⁵ skill in the art would adjust the pressure and temperature for

Art Unit: 1623

removal of the acetic acid that is formed in the process and thereby look for improvement in the yield of the desired product, with a reasonable expectation of success.

Conclusion

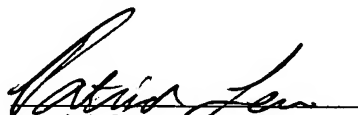
Claims 1-4 and 10-27 are rejected

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ganapathy Krishnan whose telephone number is 571-272-0654. The examiner can normally be reached on 8.30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shaojia A. Jiang can be reached on 571-272-0627. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

GK


Patrick T. Lewis
Primary Patent Examiner
Art Unit 1623